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=> s nanotube (p) substrate (p) (electrode or contact)
PROXIMITY OPERATOR LEVEL NOT CONSISTENT WITH
FIELD CODE - 'AND' OPERATOR ASSUMED 'NANOTUBE (P) SUBSTRATE'
PROXIMITY OPERATOR LEVEL NOT CONSISTENT WITH
FIELD CODE - 'AND' OPERATOR ASSUMED 'SUBSTRATE (P) '
PROXIMITY OPERATOR LEVEL NOT CONSISTENT WITH
FIELD CODE - 'AND' OPERATOR ASSUMED 'NANOTUBE (P) SUBSTRATE'
PROXIMITY OPERATOR LEVEL NOT CONSISTENT WITH
FIELD CODE - 'AND' OPERATOR ASSUMED 'SUBSTRATE (P) '
L2        1225 NANOTUBE (P) SUBSTRATE (P) (ELECTRODE OR CONTACT)

=> s nanotube (s) (span? or connect?) (s) (electrode or contact)
L3         293 NANOTUBE (S) (SPAN? OR CONNECT?) (S) (ELECTRODE OR CONTACT)

=> s l2 and l3
L4          70 L2 AND L3

=> s (electrode or contact) (s) titanium
L5       26199 (ELECTRODE OR CONTACT) (S) TITANIUM
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=> s l4 and l5
L6            0 L4 AND L5

=> s nanotube (p) substrate (s) silicon
PROXIMITY OPERATOR LEVEL NOT CONSISTENT WITH
FIELD CODE - 'AND' OPERATOR ASSUMED 'NANOTUBE (P) SUBSTRATE'
PROXIMITY OPERATOR LEVEL NOT CONSISTENT WITH
FIELD CODE - 'AND' OPERATOR ASSUMED 'NANOTUBE (P) SUBSTRATE'
L7         1403 NANOTUBE (P) SUBSTRATE (S) SILICON

=> s l4 and l7
L8           15 L4 AND L7

=> display l8 1-15 ibib abs

L8   ANSWER 1 OF 15  CAPLUS  COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER:         2004:909040  CAPLUS
DOCUMENT NUMBER:          142:270534
TITLE:                    "And" gate logic element with single-wall carbon
                          nanotube structure and its manufacture
INVENTOR(S):              Zhao, Jigang; Wang, Taihong
PATENT ASSIGNEE(S):       Institute of Physics, Chinese Academy of Sciences,
                          Peop. Rep. China
SOURCE:                   Faming Zhuanli Shenqing Gongkai Shuomingshu, 15 pp.
                          CODEN: CNXXEV
DOCUMENT TYPE:            Patent
LANGUAGE:                 Chinese
FAMILY ACC. NUM. COUNT:   1
PATENT INFORMATION:

     PATENT NO.           KIND   DATE        APPLICATION NO.         DATE
     --------------       ----   --------    --------------------    --------
     CN 1466219            A     20040107    CN 2002-123865          20020705
PRIORITY APPLN. INFO.:                       CN 2002-123865          20020705
AB   The and gate logic element consists of a Si substrate, a SiO2
     insulator, a single-wall C nanotube, 2 gates, and 3
     electrodes with the 1st and the 2nd electrodes grounded
     and the 2nd electrode connected to a constant voltage
     source through a resistance.  The gate is formed by deposition of Al in
     the groove in the SiO2 insulator and then local oxidation to form Al2O3
     insulator, and 2 electrodes are similarly formed from noble
     metal.

L8   ANSWER 2 OF 15  CAPLUS  COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER:         2004:909038  CAPLUS
DOCUMENT NUMBER:          142:270532
TITLE:                    Logic "not" gate element manufactured from carbon
                          nanotube
INVENTOR(S):              Zhao, Jigang; Wang, Taihong
PATENT ASSIGNEE(S):       Institute of Physics, Chinese Academy of Sciences,
                          Peop. Rep. China
SOURCE:                   Faming Zhuanli Shenqing Gongkai Shuomingshu, 13 pp.
                          CODEN: CNXXEV
DOCUMENT TYPE:            Patent
LANGUAGE:                 Chinese
FAMILY ACC. NUM. COUNT:   1
PATENT INFORMATION:

     PATENT NO.           KIND   DATE        APPLICATION NO.         DATE
     --------------       ----   --------    --------------------    --------
     CN 1466217            A     20040107    CN 2002-123863          20020705
PRIORITY APPLN. INFO.:                       CN 2002-123863          20020705
AB   The "not" gate logic element consists of a Si substrate, a SiO2
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insulator, a single-wall C **nanotube** on the **substrate**, a gate, and 2 **electrodes** with one **connected** to a constant voltage source. The gate is formed by deposition of Al in groove (depth 10 nm-95 μm) on the insulator and then by local oxidation to form Al2O3 insulator. The 2 **electrodes** are formed by covering 2 noble metal strips on both ends of C **nanotube**, resp.

L8 ANSWER 3 OF 15 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2004:909036 CAPLUS
DOCUMENT NUMBER: 142:270530
TITLE: "Or/not" logic element of carbon nanotube
INVENTOR(S): Zhao, Jigang; Wang, Taihong
PATENT ASSIGNEE(S): Institute of Physics, Chinese Academy of Sciences, Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 14 pp. CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 1466215	A	20040107	CN 2002-123861	20020705
PRIORITY APPLN. INFO.:			CN 2002-123861	20020705

AB The "or/not" logic element consists of a Si **substrate**, a SiO2 insulator, a C **nanotube**, 2 gates, and 2 noble metal **electrodes** (Au, Pt), one **connected** to a constant voltage source and another as an output lead. The gate is formed by deposition of Al in groove (thickness 10 nm-95 μm) on the SiO2 insulator and then local oxidation to form an Al2O3 insulator (thickness <3 nm), and the **electrode** at the outer side of the 2 gates is similarly prepared

L8 ANSWER 4 OF 15 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2004:701129 CAPLUS
DOCUMENT NUMBER: 141:216774
TITLE: Semiconductor power devices having carbon nanotube electron emitter
INVENTOR(S): Nagahama, Hideo
PATENT ASSIGNEE(S): Matsushita Electric Works, Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 28 pp. CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004241366	A2	20040826	JP 2003-149804	20030527
PRIORITY APPLN. INFO.:			JP 2002-361144 A	20021212

AB The title power devices have a SiC **substrate** which is provided with (1) an n--drift region between a p+-source region and an n+-drain region, (2) a gate **contact** impressed by voltage higher than that on the source **contact**, (3) carbon **nanotube** electron emitter for emitting **electrode** fed from the p+-source region upon impression of the voltage, (4) glass cap fixed on the **substrate** to make the electron emitter region vacuum region, and (5) a collector **contact** which collects electron emitted into the vacuum region from electron emitter **connected** via the n+-drift **contact** region in the n--drift region. The arrangement gives the semiconductor devices significantly decreased ON resistance while maintaining high withstand voltage.

L8 ANSWER 5 OF 15 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2004:472609 CAPLUS
DOCUMENT NUMBER: 141:32527
TITLE: Semiconductor sensors for detection of physical quantities
INVENTOR(S): Miyajima, Hisakazu; Yabuta, Akira; Datton, Robert
PATENT ASSIGNEE(S): Matsushita Electric Works, Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 15 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004163373	A2	20040610	JP 2002-332438	20021115
PRIORITY APPLN. INFO.:			JP 2002-332438	20021115

AB The sensors, useful for pressure sensors, acceleration sensors, comprise micromachined structures including thin flexible parts, which deform on application of certain phys. quantities, formed on semiconductor **substrates** (e.g., Si), carbon **nanotube** gage resistors, which are placed on the flexible parts on one side of the microstructures via insulator films and change their shapes on deformation of the flexible parts, patterned wirings (e.g., Al) **connected** to both ends of the resistors, and pairs of **electrodes**, placed on both ends of the resistors for **connecting** the resistors to the wirings, which have sharp peaks on their ends and are composed of catalytic metal materials (e.g., Fe, Ni, Co) for growth of carbon **nanotubes**.

L8 ANSWER 6 OF 15 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2004:400068 CAPLUS
DOCUMENT NUMBER: 142:345902
TITLE: Trapping and aligning carbon nanotubes via substrate geometry engineering
AUTHOR(S): Wang, Y. M.; Han, Wei-Qiang; Zettl, A.
CORPORATE SOURCE: Department of Physics, and Materials Sciences Division, Lawrence Berkeley National Laboratory, University of California at Berkeley, Berkeley, CA, 94720, USA
SOURCE: New Journal of Physics (2004), 6, No pp. given, Paper No. 15
CODEN: NJOPFM; ISSN: 1367-2630
URL: http://ej.iop.org/links/q34/69lnjSwmpiQd,dhyNFdGQw/njp4_1_015.pdf
PUBLISHER: Institute of Physics Publishing
DOCUMENT TYPE: Journal; (online computer file)
LANGUAGE: English
AB We present a simple method to place pregrown carbon nanotubes at specified locations on geometrically patterned silicon devices. Following room-temperature solution deposition, the **nanotubes span** gaps between pairs of tooth-shaped anchors serving as mech. and/or elec. **contacts**. With a single deposition step, at least 50% of the anchor pairs are spanned by nanotubes. With the simultaneous application of modest local elec. fields during deposition, the yield of successfully spanned anchor pairs is increased to 100%. Our placement method may find application in the reliable fabrication of nanotube-based electronic and micro-electromech. systems (MEMS) devices.
REFERENCE COUNT: 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L8 ANSWER 7 OF 15 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2004:268770 CAPLUS
DOCUMENT NUMBER: 140:313233

TITLE: Field-effect transistors having a semiconductive carbon-nanotube plugged in nano-contact holes and fabrication of carbon-nanotube FETs for array integration
INVENTOR(S): Iijima, Ryuta
PATENT ASSIGNEE(S): Sharp Corp., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 18 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004103802	A2	20040402	JP 2002-263143	20020909

PRIORITY APPLN. INFO.: JP 2002-263143 20020909

AB The title FETs comprise (1) a 1st **electrode** formed on a **substrate**, (2) an interlayer insulator layer formed over the 1st **electrode** on the **substrate**, (3) a nano-**contact** hole which is vertically formed through the interlayer insulator layer and reached down to the 1st **electrode**, (4) a gate **contact** layer formed as a sidewall in the nano-**contact** hole and extended to a circuit layer on the interlayer insulator layer, (5) a gate insulator layer which is formed as a sidewall over the gate **contact** sidewall layer and extended over the circuit on the interlayer insulator, and (6) a semiconductive carbon **nanotube** which is plugged inside the sidewalls in the nano-**contact** hole and **connected** to the 1st **electrode**. The arrangement gives the nano-FETs characteristic stability and high integration feasibility in array formation.

L8 ANSWER 8 OF 15 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2003:893047 CAPLUS
DOCUMENT NUMBER: 139:356947
TITLE: Contacting of nanotubes for integration into an electric circuit
INVENTOR(S): Duesberg, Georg Stefan; Graham, Andrew; Kreupl, Franz-Martin; Liebau, Maik; Unger, Eugen
PATENT ASSIGNEE(S): Infineon Technologies A.-G., Germany
SOURCE: PCT Int. Appl., 18 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003094226	A2	20031113	WO 2003-EP3341	20030331
WO 2003094226	A3	20040722		
W: JP, KR, US				
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR				
DE 10220194	A1	20031127	DE 2002-10220194	20020506
EP 1502299	A2	20050202	EP 2003-722370	20030331
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, FI, RO, CY, TR, BG, CZ, EE, HU, SK				
JP 2005529481	T2	20050929	JP 2004-502347	20030331
US 2005148174	A1	20050707	US 2004-980983	20041103

PRIORITY APPLN. INFO.: DE 2002-10220194 A 20020506
WO 2003-EP3341 W 20030331

AB The invention relates to a method for contacting nanotubes, especially C nanotubes, in view of the integration thereof into an elec. circuit.

After being applied to the metallic strip conductors of the elec. circuit, the **nanotubes** are **connected** to the same at the points of **contact** by means of current-less metalization.

L8 ANSWER 9 OF 15 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2003:693255 CAPLUS
DOCUMENT NUMBER: 139:189511
TITLE: Memory device utilizing carbon nanotubes and method of fabricating the memory device
INVENTOR(S): Choi, Won-Bong; Yoo, In-Kyeong; Chu, Jae-Uk
PATENT ASSIGNEE(S): Samsung Electronics Co., Ltd., S. Korea
SOURCE: Eur. Pat. Appl., 28 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1341184	A1	20030903	EP 2003-250805	20030207
EP 1341184	B1	20050914		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
JP 2003264249	A2	20030919	JP 2003-30273	20030207
CN 1450643	A	20031022	CN 2003-128592	20030209
US 2003170930	A1	20030911	US 2003-361024	20030210
US 7015500	B2	20060321		

PRIORITY APPLN. INFO.: KR 2002-7709 A 20020209
KR 2002-71398 A 20021116

AB A C **nanotube** memory device and a fabrication method thereof are provided. The C **nanotube** memory device includes a **substrate**, a source **electrode**, a drain **electrode**, a C **nanotube**, a memory cell, and a gate **electrode**. The source **electrode** and the drain **electrode** are arranged with a predetd. interval between them on the **substrate** and subjected to a voltage. The C **nanotube connects** the source **electrode** to the drain **electrode** and serves as a channel for charges. The memory cell is located over the C **nanotube** and stores charges from the C **nanotube**. The gate **electrode** is formed in **contact** with the upper surface of the memory cell and controls the amount of charge flowing from the C **nanotube** into the memory cell. As described above, the C **nanotube** memory device includes the C **nanotube** having a high conductivity and a high emissivity, and the memory cell having an excellent charge storage capability, so that the memory device can function as a fast, highly-integrated memory device without errors.

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L8 ANSWER 10 OF 15 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2003:261166 CAPLUS
DOCUMENT NUMBER: 138:264192
TITLE: Electronic devices having SiC semiconductors and fabrication of devices for decreasing contact resistance
INVENTOR(S): Minakami, Makoto; Imai, Kiyoshi; Shinohe, Takashi
PATENT ASSIGNEE(S): Toshiba Corp., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 12 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2003100658	A2	20030404	JP 2001-295115	20010926

PRIORITY APPLN. INFO.: JP 2001-295115 20010926

AB The title devices comprise a p- or n-SiC semiconductor **substrate** and carbon **nanotube**-containing carbon **electrodes** provided on the **substrate**. The formation of the C **electrodes** involves vacuum-heating the SiC **substrate** to remove the surface region of Si out of SiC **substrate** and growing C **nanotube** in direct **connection** to the C atom on the **substrate** surface for decreased **contact** resistance between the SiC **substrate** and C **electrodes**.

L8 ANSWER 11 OF 15 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1999:331177 CAPLUS
DOCUMENT NUMBER: 130:360254
TITLE: Carbon nanotube devices and their manufacture
INVENTOR(S): Den, Toru; Iwasaki, Tatsuya
PATENT ASSIGNEE(S): Canon K. K., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 11 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 11139815	A2	19990525	JP 1997-305512	19971107
JP 3363759	B2	20030108		

PRIORITY APPLN. INFO.: JP 1997-305512 19971107

AB The title device comprises carbon **nanotubes** at least whose one ends are connected to a **substrate**, and the connected parts comprise catalyst ultrafine powders containing Fe, Co, and/or Ni dispersed in a material containing Cu, Ag, Au, and/or Cr. Claimed process comprises thermal decomposition of a raw material gas containing ethylene, acetylene, and/or CO at 400-800° for growth of carbon **nanotubes** on the above **substrate**. The carbon **nanotubes** are **connected** on an **electrode** of the device, in which elec. current is controlled by magnetic field.

L8 ANSWER 12 OF 15 COMPENDEX COPYRIGHT 2006 EEI on STN
ACCESSION NUMBER: 2006(4):2728 COMPENDEX
TITLE: Synthesis of nanoscale devices for neural electrophysiological imaging.
AUTHOR: Dell'Acqua-Bellavitis, Ludovico M. (Engineering Science Rensselaer Polytechnic Institute, Troy, NY, United States); Ballard, Jake D.; Bizios, Rena; Siegel, Richard W.
MEETING TITLE: 2005 Materials Research Society Spring Meeting.
MEETING LOCATION: San Francisco, CA, United States
MEETING DATE: 28 Mar 2005-01 Apr 2005
SOURCE: Materials Research Society Symposium Proceedings v 872 2005.p 395-400, arn: J18.17
SOURCE: Micro- and Nanosystems - Materials and Devices
CODEN: MRSPDH ISSN: 0272-9172
PUBLICATION YEAR: 2005
MEETING NUMBER: 66357
DOCUMENT TYPE: Conference Article
TREATMENT CODE: Theoretical; Experimental
LANGUAGE: English

AN 2006(4):2728 COMPENDEX
AB A device with nanometric resolution in space and millisecond resolution in time, intended for neural electrophysiological imaging applications, is being developed and fabricated for in vitro experimentation. The device consists of (i) an integrated circuit (IC) platform and (ii) a carbon **nanotube**/polymethylmethacrylate composite construct. Arrays of equi-spaced multiple gold **electrodes** were fabricated using combined e-beam and optical lithography to achieve three types of IC platforms with three different scales of resolution. Carbon **nanotubes** were synthesized on **silicon** dioxide **substrates** using a chemical vapor deposition method. Subsequently, the carbon **nanotube** arrays were infiltrated with in situ polymerized polymethylmethacrylate to achieve electrical insulation between adjacent **nanotube** bundles. The composite construct was fabricated and exhibited electrical conductivity and **connectivity** between two faces of the composite along the length of the **nanotubes**. The carbon **nanotube** arrays grown on **silicon** dioxide exhibited uniform length and a high level of alignment, which was preserved subsequent the in situ polymerization process. The devices can be deployed as an interface between ICs and mammalian cells. $CPY 2005 Materials Research Society. 4 Refs.

L8 ANSWER 13 OF 15 COMPENDEX COPYRIGHT 2006 EEI on STN
ACCESSION NUMBER: 2004(31):4768 COMPENDEX
TITLE: Effects of surface forces and phonon dissipation in a three-terminal nanorelay.
AUTHOR: Jonsson, L.M. (Department of Applied Physics Chalmers University of Technology Goteborg University, SE - 412 96 Goteborg, Sweden); Nord, T.; Kinaret, J.M.; Viefers, S.
SOURCE: Journal of Applied Physics v 96 n 1 Jul 1 2004 2004.p 629-635
CODEN: JAPIAU ISSN: 0021-8979
PUBLICATION YEAR: 2004
DOCUMENT TYPE: Journal
TREATMENT CODE: Theoretical; Experimental
LANGUAGE: English
AN 2004(31):4768 COMPENDEX
AB A nanoerlay system in which a conducting multiwall carbon **nanotubes** (CNT) (MWNT) was placed on a terrace in a **silicon** dioxides **substrates** and **connected** to three **electrodes** was analyzed. The short range and van der Walls forces had an impact on the characteristics of the relay and introduce design constraints. The effects of dissipation due to phonon excitation in the drain **contact**, which changes the switching time scales of the system, decreasing the longest time scale by 2 order of magnitude were also discussed. It was found that the nanorelay can be used as a memory element and investigate the dynamics and properties of such a device.(Edited abstract) 26 Refs.

L8 ANSWER 14 OF 15 INSPEC (C) 2006 IET on STN
ACCESSION NUMBER: 2004:8097163 INSPEC
DOCUMENT NUMBER: A2004-20-8120V-020; B2004-10-0587-011
TITLE: Carbon **nanotube** coatings for thermal control
AUTHOR: Sample, J.L.; Rebello, K.J.; Saffarian, H.; Osiander, R. (Appl. Phys. Lab., Johns Hopkins Univ., Laurel, MD, USA)
SOURCE: The Ninth Intersociety Conference on Thermal and Thermomechanical Phenomena In Electronic Systems (IEEE Cat. No.04CH37543), Vol.1, 2004, p. 297-301 Vol.1 of 1561 pp., 8 refs.
Editor(s): Ramakrisha, K.; Sammakia, B.G.; Culham, J.R.; Joshi, Y.K.; Pang, J.H.-L.; Jonnalagadda, K.; Tonapi, S.; Refai-Ahmed, G.; Tom Lee, T.-Y.; Copeland,

D.W.; Ellsworth Jr, M.J.
ISBN: 0 7803 8357 5
Price: 0-7803-8357-5/04/$20.00
Published by: IEEE, Piscataway, NJ, USA
Conference: The Ninth Intersociety Conference on Thermal and Thermomechanical Phenomena In Electronic Systems, Las Vegas, NV, USA, 1-4 June 2004
Sponsor(s): Components, Packaging and Manufacturing Technol. Soc. of the Inst. of Elec. and Electron. Eng
DOCUMENT TYPE: Conference; Conference Article
TREATMENT CODE: Experimental
COUNTRY: United States
LANGUAGE: English
AN 2004:8097163 INSPEC DN A2004-20-8120V-020; B2004-10-0587-011
AB Materials based on carbon **nanotubes** (CNT) with their high thermal conductivity, the high aspect ratios as well as their mechanical strength, provide innovative materials for thermal control applications such as improved thermal interfaces. We demonstrate the feasibility of carbon **nanotube** based systems for use in thermal control applications, e.g. as a **contact** layer between two thermally **connected** materials. Multi-wall carbon **nanotube** (MWCNT) arrays of different density and length have been grown on silicon and copper surfaces using chemical vapor deposition. Measurements of the heat flow across different surfaces demonstrates that a CNT array as a **contact** layer will improve the thermal transport in vacuum, with a significant improvement over thermal grease designed for this purpose. An important application for this technology is in a thermal switch, where the **contact** between the two surfaces is not static and conducting epoxies or thermal grease cannot be used

L8 ANSWER 15 OF 15 INSPEC (C) 2006 IET on STN
ACCESSION NUMBER: 2001:6799666 INSPEC
DOCUMENT NUMBER: A2001-03-8120V-014; B2001-02-0587-001
TITLE: Catalytic growth of carbon nanofibers on a porous carbon **nanotubes substrate**
AUTHOR: Renzhi Ma; Bingqing Wei; Cailu Xu; Ji Liang; Dehai Wu (Dept. of Mech. Eng., Tsinghua Univ., Beijing, China)
SOURCE: Journal of Materials Science Letters (1 Nov. 2000), vol.19, no.21, p. 1929-31, 20 refs.
CODEN: JMSLD5, ISSN: 0261-8028
SICI: 0261-8028(20001101)19:21L.1929:CGCN;1-8
Published by: Kluwer Academic Publishers, USA
DOCUMENT TYPE: Journal
TREATMENT CODE: Practical; Experimental
COUNTRY: United States
LANGUAGE: English
AN 2001:6799666 INSPEC DN A2001-03-8120V-014; B2001-02-0587-001
AB After the discovery of carbon **nanotubes** (CNTs) synthesized by an arc-discharge, catalytic methods were also applied to yield large quantities. It was soon realized that the catalytic decomposition of hydrocarbons is suitable for commercial application. Various hydrocarbons, such as C2H2, C2H4, C3H6 etc., were decomposed using carbon black and graphite or silica covered or embedded with transition metal nanoparticles as the **substrate**. Some researchers have also reported catalytically grown CNTs film on glass or **silicon substrates** for various potential applications, especially for panel displays because carbon **nanotubes** exhibit excellent field emission characteristics. In fact, the catalytic methods have been employed to synthesize vapor grown carbon fibers (VGCFs) or various carbon nanostructures (e.g., filaments and nanofibers). With the advent of CNTs, it is commonly considered that the characteristics of the VGCFs, as the diameter decreases, bear a close **connection** to CNTs. Carbon **nanotubes** have large surface area for their nanometer dimension. It has been reported that carbon **nanotubes** can be

applied as high surface area **electrodes** in electrochemical capacitors. In addition to filling metals into the inner core of carbon **nanotubes**, it was also found that metals or metal oxides, such as Pt, Au, Ag, and RuO2 were easily deposited onto their surface. So it was predicted that carbon **nanotubes** could be used as catalyst carriers. Here carbon nanofiber is prepared on a porous CNTs **substrate** by thermal decomposition of C3H6 in the presence of nickel catalyst particles in a hydrogen atmosphere